an opportunity of investigating the vegetation of a part of our island, hitherto but little explored by botanists. He had found in all—

Equiseta	11	species	and varieties.
Filices	32	,,	,,
Lycopodia	5	,,	,,
Musci	170	,,	,,

3. "Remarks on the Hardiness of certain Coniferæ, as shown by the effects of the past winter," by Mr. W. W. Evans.

4. "Notice of the production of Cones in 1851 on *Pinus Lambertiana*," by A. G. Spiers, Esq. The tree on which the cones were produced was stated to be about 23 feet in height; the cones contained perfect seeds, from which young plants have been raised.

Mr. M'Nab stated that several plants of *Abies Morinda* were fruiting this season in different situations. He mentioned that all these plants had grown in the Botanic Garden, and had been transplanted last year. The large plants of the same pine which had not been transplanted showed no symptoms of flowering.

5. "Measurement of Trees in Gurhwal and Kemaon in 1852," by Mr. John Strachey, C.S.

6. "Notice of the Osseous legumen of the *Hymenæa courbaril*," by Dr. Seller.

7. "On the rarer plants found in the neighbourhood of Ripon," by Mr. James B. Davies.

8. "On *Melampyrum montanum*, Johnst.," by Daniel Oliver, jun., Esq., F.L.S. "This plant, as described in the Berwickshire Flora, and mentioned in Babington's 'Manual' as a variety of *M. pratense*, I am induced to believe has been founded by Dr. Johnston on an examination of an insufficient series of examples of more or less distinct forms of *Melampyrum*.

"Last year I described in the 'Phytologist,' a plant which I called *M. pratense* var. *ericetorum*, and in the same communication hinted that its smaller forms might be identical with the *M. montanum*.

"I am rather strengthened in this opinion by a series of specimens which I collected last month near the Wall-town Crags, Northumberland. The floral leaves (bracts) are in some of the larger instances of the plant, ovate-lanceolate or almost ovate at the base, and deeply toothed, while the smaller ones accord more nearly with *M. montanum*."

MISCELLANEOUS.

On the Movements of the Blood in the Pulmonary Arachnida. By E. Blanchard.

In the circulation of these animals there is a much more complicated mechanism than has ever been supposed. Although the venous blood is not contained in tubes capable of isolation by dissection, it is none the less confined to a particular course.

If a very small opening be made into the heart of a living Scorpion,

and through this a coloured fluid be introduced into the circulation, the heart drives this liquid to the extremities of the finest arteries. Arrived at the last ramifications, the blood certainly slackens in its progress whilst passing through the capillary network. This network, which has not yet been pointed out in the Articulata, exists under the teguments and between the various layers of muscles in the connective tissue; it consists of distinctly circumscribed canals lined with a thin epithelium. Thence the blood is received by the venous canals.

These are only canals and sometimes sinuses and not tubes; but they are always lined with a membrane, which it is frequently not difficult to detach from the surrounding tissues. There are no valvules to prevent the return of the blood. Nevertheless the blood always follows a determinate course, and in fact the disposition of the muscles favours the passage of the fluid in one direction, but presents an obstacle, sometimes absolutely insurmountable, to its passage in the other direction.

In injecting a coloured fluid into the abdominal cavity, it is seen to penetrate readily into most of the spaces occupied by the venous blood, whilst it does not enter the venous canals of the feet or other appendages. A resistance is here presented which is not overcome by considerable pressure; the flexor and extensor muscles of the legs approaching at their points of attachment close the passage from within outwards. It will be readily understood, in fact, that without some particular arrangement, the blood, existing in abundance in the thoracic cavity, would always have a tendency to fall back in the venous canals of the extremities.

The legs are more or less exposed to be broken in the Arachnida. These fractures always take place at the articulations, and the animal does not suffer much from them. A little drop of blood may form at the extremity of the broken limb, but the contraction of the muscles closes the artery, and the venous canal is so disposed that the normal course of the blood is never interrupted for an instant. At the extremity of each joint of the legs the large venous canal is curved back so as to take up all the blood coming from the lesser canals. This arrangement completely explains why when half the leg of a Scorpion or Spider is torn off the blood escapes from the detached portion, and not from that which remains attached to the body.

The venous blood collected from various parts of the body arrives at last in canals situated at the sides and lower part of the abdomen, whence it passes to the respiratory organs. The principal venous canals are lodged in the interstices of the segments, and are formed by a fold of the internal membrane. In the Scorpions, the venous canals of the caudiform portion of the abdomen and those of the feet consist of gutters which show themselves externally as so many ridges.

In the Arachnida, nearly as in the Crustacea, the blood returns to the heart from the respiratory organs by means of vessels passing up along the sides of the abdomen and opening into the pericardiac cavity. This is effected in the following manner.

The respiratory organs are covered by a tolerably thick membrane, which is contracted between each of them, and prolonged in front and behind in the form of a wide vessel receiving the venous blood. Each pulmonary sac is alternately raised or depressed by a double or triple ligament, which rises perpendicularly and is attached to the pericardium. When a portion of the heart is exposed, it is seen that its pulsations act upon the contractile ligaments, causing a pressure of the pulmonary sacs, which forces the blood to rise in the pneumocardiac vessels. This movement is aided by muscular pillars attached to the upper and lower walls of the abdomen.

From all these facts we must conclude, that in the pulmonary Arachnida the venous blood circulates for a great portion of its course in distinctly circumscribed canals; that it passes into the abdominal cavity as into a vast sinus, so as to penetrate thence into the respiratory organs, whence it rises into the heart by means of a particular mechanism. These facts lead us naturally to the conclusion that analogous arrangements should be sought for in Crustacea and Insects.—*Comptes Rendus*, June 20, 1853, p. 1079.

THE TIBETAN BADGER OF HODGSON.

Mr. Hodgson having sent to the India House a specimen with its skull of his *Taxidea leucurus* (Journ. Asiatic Soc. Bengal, xvi. 763. 1847), I have compared the skull with that of the various Badgers in the Museum collection. I find all the Old-World Badgers (*Meles*) have a moderate-sized triangular flesh tooth, and a very large four-sided oblong tuberculous grinder in the upper jaw, which is rather longer than broad, and the skull is rounded behind. The nose of the Tibetan Badger or Tumpha, *Meles leucurus*, is rather more tapering and more compressed than that of the European Badger (*Meles Taxus*), which it most resembles. The Japanese Badger (*Meles anakuma*) differs from both in having a much shorter skull and a short, rather broad nose.

The American Badgers (*Taxidæ*, Waterhouse) have a very large triangular flesh tooth, and an equally triangular tubercular grinder in the upper jaw not exceeding the flesh tooth in size. The skull is also much broader, more depressed and truncated behind. Of this genus I only know a single species, *T. Labradoria*.—J. E. Gray.

Note on the Germination of the Spores of the Uredines.

By L. R. Tulasne.

Some years since I made known* the origin and structure of the organs known as the spores of these plants. I then showed that these bodies, like the pollen grains of phanerogamous vegetables, are furnished with a variable number of pores through which tubular filaments afterwards pass, analogous, at least in appearance, with those which are the first result of the germination of the spore of a Fungus.

I have since indicated† the *Æcidiolum exanthematum*, Ung., as a

* Ann. des Sci. Nat. 3rd série, t. vii.

† Comptes Rendus, xxxii. March 31, 1851.